CLAIMS

1. A process for producing chlorine comprising the step of oxidizing hydrogen chloride in a gas containing hydrogen chloride with a gas containing oxygen in the presence of a catalyst, wherein the oxidation of hydrogen chloride is carried out in at least two reaction zones each comprising a catalyst-packed layer, which are arranged in series, and a temperature in at least one of said reaction zones is controlled with a heat exchange system.

2. The process according to claim 1, wherein at least two reaction zones each comprising a catalyst-packed layer, which are arranged in series, are formed by packing at least two kinds of catalysts in a tubular reactor.

3. The process according to claim 1, wherein at least two reaction zones each comprising a catalyst-packed layer, which are arranged in series, are formed by independently controlling the temperatures of said at least two reaction zones.

4. The process according to claim 1, wherein the temperatures in at least two reaction zones are controlled with a heat exchange system.

5. The process according to claim 1, wherein the temperatures in all the reaction zones are controlled with a heat exchange system.

6. The process according to claim 1, wherein the ratio

of the first reaction zone, in which the raw materials are firstly supplied among at least two reaction zones each comprising a catalyst-packed layer, which are arranged in series, is 70 % by volume or less based on the total volume of all the reaction zones.

7. The process according to claim 1, wherein the reaction zones are packed with substantially the catalyst only, a mixture of substantially the catalyst and an inactive material, a mixture of substantially the catalyst and a carrier, or a mixture of substantially the catalyst, the inactive material and the carrier so that the thermal conductivity becomes highest in the first reaction zone.

8. The process according to claim 1, wherein the reaction zones are packed with substantially the catalyst only, a mixture of substantially the catalyst and an inactive material, a mixture of substantially the catalyst and a carrier, or a mixture of substantially the catalyst, the inactive material and the carrier so that the thermal conductivity in the reaction zones successively decreases from the first reaction zone to the last reaction zone along the direction of the gas flow.

9. The process according to claim 1, wherein the reaction zones are packed with substantially the catalyst only, a mixture of substantially the catalyst and an inactive material, a mixture of substantially the catalyst

and a carrier, or a mixture of substantially the catalyst, the inactive material and the carrier so that the activities of the reaction zones successively increase from the first reaction zone to the last reaction zone along the direction of the gas flow.

10. The process according to claim 1, wherein a gas temperature at the exit of the last reaction zone is in the range between 200 and 350°C.

11. The process according to claim 1, wherein a superficial linear velocity of the gas in the column is from 0.2 to 10 m/sec.

12. The process according to claim 1, wherein the volume of the gas containing oxygen is divided and supplied in the reaction zones.